Dimensions of distance: international flight connections, historical determinism, and economic relations in Africa

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Structured abstract:

Purpose: The paper examines how distance manifests in terms of air passenger transport links between countries and focuses on the 48 countries of sub-Saharan Africa (SSA). It asks to what extent do existing flight connections reflect economic relations between countries and if so, do they represent past, current or future relations? It asks whether the impact of distance is similar for all countries and at different stages of development.

Design/methodology/approach: Passenger flight connection data was extracted to generate map images and flight frequencies in order to observe inter-relationships between different locations and to observe emerging patterns. The paper uses ESRIs ArcGIS software to visualise all these data into maps.

Findings: SSA is poorly connected both intra- and inter-continentally. Cultural and historical ties dominate and elements of historical determinism appear within flight connections in SSA reflecting the biases associated with colonialism. Larger economies in SSA are less dependent on these past ties and their flight connections reveal a greater level of diversity and interests. SSA has generally been slow to develop flight routings to the new emerging markets.

Originality/value: Its contribution lies not only in examining these flight patterns for an under-researched region but aides in future work on SSA and its integration into the global economy and international business networks. It argues that whilst distance matters; how it matters varies.

1. Introduction

The world may be flat but distance still matters in international business. At its most basic, it affects the transaction costs of activities and therefore impacts on location decisions, and the choice and sequence of market entry, amongst other factors. Already in 1960, Hymer noted that the "liability of foreignness" increases with the distance between home and host countries. Distance manifests not only in terms of geography but in other dimensions including that of "psychic distance" (Johanson and Vahlne, 1977) and cultural, administrative, and economic (Ghemawat, 2001) dimensions. Berry, Guillen, and Zhou (2010: 1463) develop these further to include a number of additional factors (discussed later) and argue that "previous scholarship on cross-national distance has tended to be one-dimensional and time-invariant in nature". Their work raises the question of whether the impact of distance is similar for all countries and at different stages of development?

Air passenger flight connections represent one measure of how countries are connected - for example, Otiso et al. (2011) use airline connectivity as a measure of the globalisation of cities. These air transport connections between countries may represent the economic relations, but also the cultural and historical ties that bind countries together in global transnational networks. Economic ties change over time and this raises the question of the extent to which international flight connections respond to these changes, or to what extent the other ties (such as cultural and historical) dominate these transport connections.

The paper looks at how existing flight connections reflect economic relations between countries in sub-Saharan Africa (SSA) and whether they represent past, current or future relations? It focuses on how these flight patterns reflect tensions between old and new economic relations, and how historical and cultural ties as a result of colonialism continue to impact on how Africa connects to the rest of the world through commercial air links, more than five decades after most of these countries gained independence. This raises interesting and important points around historical determinism especially for developing countries and brings into question continuing imbalances in global economic relations. There are limitations to this work and the study is exploratory and suggestive in nature but we have not seen this analysed before in this manner and as such it adds to the existing knowledge base and raises new areas for future research. The paper highlights the difficulty for SSA of becoming more globally integrated,

when it is poorly connected through air links. There are number of dimensions to this, including addressing the deficient track record of African airlines, deregulating air services and opening the African markets to transnational competition, improving airport infrastructure, and at a broader international political economy level, a concerted push to promote trade, investment and development on the continent.

SSA is a particularly interesting case to examine because of its unique historical relations and because it is undergoing a rapid economic transformation. The International Air Transport Association (IATA, 2014) estimates that Africa will be one of the fastest growing markets in aviation over the next two decades and that eight of the ten fastest-growing markets in percentage terms will be in SSA. What do existing flight connections in SSA reveal about the region's integration and relations with the rest of the world? Do they reflect the new patterns of the rising world (Yamin and Sinkovics, 2015) or are they reflective of past historical relations and thus a form of historical determinism? How does distance manifest in these flight patterns?

2. Literature review

2.1 Dimensions of distance in international business and air transport

Although there is some support for the notion that the world has become flat because of modern transportation, technological advancements, and communication systems, Combes et al. (2008) state that the location of economic agents does not matter any less. They posit that distance and other spatial phenomena are continuing to play a central role in economic life. They also note a rise in the complexity of considerations due to an increasingly diverse set of factors that affect the location decisions of economic participants and trading partners. This raises the centrality of the concept of distance in modern economic relations.

The importance of distance in the field of international business has a rich history and was widely embraced under the concept of psychic distance (Johansen and Vahlne, 1977). A full review of the development of the concept of distance lies beyond the remit of this paper (see Boeh and Beamish, 2012; Shenkar, 2012; Zaheer, Schomaker, and Nachum, 2012) but the construct has taken on a range of dimensions. For example, Ghemawat (2001) presents the

underlying notions underpinning distance within the CAGE acronym - cultural, administrative, geographic, and economic dimensions of distance, whilst Berry et al. (2010) analyse nine dimensions of cross-national distance including economic, financial, political, administrative, cultural, demographic, knowledge, connectedness, and geographic. The notion of distance seeks to highlight that international transactions are affected not only by the "costs of overcoming physical distances, such as transportation and tariffs, but also the costs associate with the collection and interpretation of the information required to effect such transactions" (Ambos and Hakanson, 2014: 2).

Although distance is more than geography, geographic distance is a fundamental element thereof and includes physical remoteness, lack of a common border, and poor infrastructure. Historically, interactions between international players were largely determined by physical distances between countries and it has been found that geographical distance is more than thrice as important as cultural distance (Håkanson and Ambos, 2010). As a result, transportation linkages are an important element of addressing the costs imposed by distance. Already in 1969, Friedmann predicted that large air terminals would become the new communication nodes and that major urban growth would take place around such emerging centres, as they would become the preferred location for economic activities that require swift and efficient contact with centres across the world. Likewise, Arvis and Shepherd (2011) demonstrate links between economic activity and the presence of transport networks that support and enable connectivity between geographically dispersed locations. Air transport specifically is highlighted as a driver of broader economic activity, with air connectivity said to be a vitally important factor for the development of locations around the world as business destinations (McQuaid, Greig, Smyth, and Cooper, 2004). Otiso et al. (2011: 611) state that air transport is the "preferred mode of inter-city movement for the transnational capitalist class, migrants, tourists and high-value goods" and that air networks and the associated infrastructure are the most visible manifestation of international interaction and a country's integration into the world economy. In addition, the air transport sector itself is a major employer, as well as a significant enabler for businesses to operate in the global market place, which has become increasingly internationalized, and an integral part of tourism (both in leisure and business) as over 52% of international tourists travel by air (IATA, 2014). Communities and regions across the world therefore need access to air transport in order to preserve and boost their economic standing (Smyth et al., 2012).

2.2 Historical causation, economic relations and air transport

Within SSA, Storeygard (2013) states that air travel is the most important means of transport suitable for moving goods and people to market. He argues that this is due to mostly non-existent or poor road, rail, and port infrastructure. In addition, the continent is characterized by large land masses and vast geographical distances between major centres which lends itself to the aviation industry. However, airline connectivity on the continent is considered poor (see Abate, 2016; Otiso et al., 2011; Pirie, 2014) and connections between economic centres often require indirect, complex routes and travel distances disproportionate to the most direct routing. For example, a flight from Sierra Leone to Sudan or Uganda normally requires three or four flights and over 19 hours for what should be a five hour direct trip. Often travel between African cities necessitates flights through Europe because of a lack of connectivity. One could argue that this is a modern version of dependency theory[i] between core and peripheral economic areas with the imperial cities of Europe such as Brussels, Paris and London still determining the economic integration of past colonial outposts. Westwood and Jack (2007: 247) argue that "the colonial condition, and its formal structures of domination, did not suddenly disappear after the end of formal direct-rule. The effects of colonialism continue to reverberate in profound cultural and material ways, particularly when colonialism is understood as the contemporary global system of hegemonic economic power under late capitalism".

In the 1970s, Gutkind and Wallerstein (1976) put forward the idea of the "chain of historical causation" that seeks to explain economic relations and polity of SSA in the light of the evolving world-system of economic and political relations. These relationships can be traced back to the sixteenth century through to the twentieth century during which countries in SSA were subjugated to the major Western powers both economically and politically through conquest, repression and exploitation. The uneven power distribution among different regions in the world still manifests in the domains of economics, politics, and general societal relations. Proximity to world knowledge and markets have become key drivers of economic prosperity, and the implication for resource rich countries in the periphery is that they do not necessarily benefit from their endowment in natural resources, as the effects of geographic isolation lead to

underdevelopment (Aizenman et al., 2003). Furthermore, inaccessibility of peripheral countries hinders learning and information flows associated with trade (Redding and Schott, 2003).

This paper examines what international flight connections in SSA disclose about its connectedness with the economic centres of the world and whether they reveal current, future or past relations? To what extent has historical determinism caused by colonialism and its uneven power distribution (Bobby Banerjee and Prasad, 2008; Button, Martini and Scotti, 2015; Westwood and Jack, 2007) resulted in flight connections still reflecting those dynamics and how do dimensions of distance impact on these flight patterns?

2.3 The evolution of air transport in Africa

The evolution of air transport in Africa was shaped deeply by its colonial experience. Of the 54 currently independent countries in Africa, only two were not under colonial rule during the 20th century. Pirie (2014: 248) states that the "structure and geography of Africa's commercial air transport was fixed strongly by its roots in the 1930s during colonial projects to assist European commerce and administration." He explains that colonial Africa was a significant part of the overseas ambitions and itineraries of European airlines during this time. Furthermore, after the Second World War the arrival of American carriers elevated the area's locus on the global airline map. However, as the size of the aviation industry accelerated in terms of reach and capacity, Africa was left behind and in 2015 it was the world's smallest air-traffic market accounting for 2.18% of global revenue passenger kilometres, 2.13% of revenue tonne kilometres, and 2.2% of total passengers carried (AFRAA, 2016). Pirie (2014) and Abate (2016) maintain that the region's small share of global air transportation is surprising because there are a number of conditions which lend themselves to a thriving sector. These include the size of the continent's population (at over a billion people), a large land mass (second only to Asia), the vast distances between economic centres and capital cities, the reality that almost a third of the countries are landlocked, and that alternative modes of transport are underdeveloped which should all play to the sector's advantage. However, a combination of a lack of discretionary income to afford air travel, combined with its location on a world map which does not favour intercontinental hubs, and the fact that aviation does not lend itself to high-bulk agricultural and mineral exports, have all acted as constraints (Pirie, 2014: 247). African airlines themselves have

been part of the problem and have been riddled with management difficulties, high costs, poor safety, corporate bankruptcies, government interference, low productivity, overstaffing, inappropriate and older aircraft, skills shortages, low load factors, and other inefficiencies (Amankwah-Amoah and Debrah, 2014; Heinz and Connell, 2013). Most African countries do not have a competent airline that can operate international services and thus foreign airlines carry about 65% of air traffic to and from Africa (Abate, 2016: 327). Only four African airlines belong to one of the global airline alliance groupings namely South African Airways, Egyptair, Ethiopian (all of which are part of the Star Alliance), and Kenya Airways (part of SkyTeam). Other airlines have not been included because potential candidates are required to possess scarce resources which can add value to the alliance such as the possession of an extensive network, critical mass, and a strategic geographical coverage, and these advantages are not currently possessed by airlines on the continent (Amankwah-Amoah and Debrah, 2011).

International initiatives to introduce market liberalisation into the air transport sector have had less impact on the African continent than elsewhere despite various efforts at institutional reform. The Yamoussoukro Declaration of 1988 represented an African initiative to prepare for the consequences of economic deregulation and the growth of open skies policies internationally. This was followed by the 1997 Banjul Accord which was a West African attempt to create a single geographical commercial air transportation operation zone. Even more significant, was the Yamoussoukro Decision of 1999 which committed its 44 signatory countries to deregulate air services, and open their markets to transnational competition. However, progress has remained slow and "there remains little practical integration of national airline networks in Africa" (Button et al., 2015: 631).

A snapshot of the passenger aviation sector in Africa in 2015 reveals the following. 48.29 million scheduled passengers were carried on international routes, while 31.21 million were carried on domestic routes. Intra-African passenger flows makes up only 22% of total passenger flows on the continent and this goes back to colonial roots when the priority was linking the north-south axis to the colonial powers in Europe, and only more recently tilting eastwards to the Gulf and the Asia-Pacific (Pirie, 2014: 248). In 2015, the top five passenger countries in Africa were South Africa (22,485,844 passengers), Egypt (20,119,261), Morocco (14,177,413), Nigeria (8,503,033), and Algeria (8,309,833) (AFRAA, 2016). In terms of route area, the top 10

passenger airport pairs in 2015 between Africa and other regions was as follows: Cairo-Jeddah, Cairo Riyadh, Algiers-Paris Orly, Cairo-Kuwait, Alexandria-Jeddah, Cairo-Dubai, Johannesburg-London Heathrow, Tunis-Paris Orly, Lagos-London Heathrow, and Khartoum-Jeddah. Two glaring patterns emerge immediately, namely the impact of religious travel portrayed by the role of Jeddah as the gateway to Mecca and Medina, and the dominance of colonial air links between London and Paris and their ex-colonies. Whilst Europe's historic share is being reduced by the Asia-Pacific growth, the colonial influence remains strong and we examine this in more detail below.

3. Research methodology and data

Passenger flight connection data was extracted for October 2014 from the database of openflights.org to generate map images in order to observe inter-relationships between different locations and to observe emerging patterns. The second data set comprised of flight frequency data, which was obtained from reports generated on the system of the Airlines Association of Southern Africa (AASA). Extracting the data from these two sources was not a trivial exercise and generated massive files which had to be sorted through, organized, and then mapped.

The population of secondary flight data comprised all flights and airlines worldwide as contained in the openflights.org database based on their activities in the 48 countries that make up SSA. The research focuses exclusively on international flights, both intercontinental and regional. It defines intercontinental flights as those destinations located outside the continent of Africa, and regional flights as those destinations within the continent of Africa, but outside the borders of the country of origin of the flight.

After extracting all the data and mapping it, the research delved deeper into a sub-sample and adopted guidelines of purposive sampling to ensure that those airports included are most relevant to the posed research questions. One common thread evident in countries located in SSA is that almost of them are former colonies or protectorates. A sample of six cities was selected for deeper analysis reflecting the diversity of former colonial relationships: Abidjan, Johannesburg, Kinshasa, Lagos, Luanda, and Maputo. Two from Francophone, two from Anglophone, and two from Lusophone African countries. Geodesic lines were generated to

reflect connections between city pairs to represent flight routes. ESRIs ArcGIS software was used to visualise all these data into maps.

4. Presentation of results

Figure 1 presents all the routes and airports contained in the initial flights.org data. The map represents 67,663 routes. In this form, the map gives an indication of global regions where most airports are concentrated and shows that North America and Europe enjoy a greater concentration of airports per area.

INSERT FIGURE 1 HERE

The research proceeded to extract data for SSA only resulting in Figure 2 which shows how SSA connects to the rest of the world. The routes reflected in this map show intercontinental flights only (227 unique intercontinental flights) that departed from airports in sub-Saharan cities in October 2014 and thus excludes national and regional flights. According to the DHL Global Connectedness Index, SSA as a region is amongst the least globally connected regions in the world (Ghemawat and Altman, 2014) and this is confirmed through the flight connection frequencies and patterns as is discussed further below.

INSERT FIGURE 2 HERE

The study further refined the search, as discussed above, and figure 3 shows regional and intercontinental flights from the sample of six sub-Saharan cities: Abidjan, Johannesburg, Lagos, Luanda, Kinshasa, and Maputo. It proceeds to examine each of these cities and their international flight connections to explore whether they reveal past historical ties, as well as whether new and upcoming relationships are reflected in the flight connections, and how distance manifests in these relations.

INSERT FIGURE 3 HERE

4.1 Abidjan

The data shows three intercontinental flights that originate from Abidjan destined for Brussels, (Belgium), Istanbul (Turkey), as well as Paris (France). Flight frequencies observed from the international flights in question during October 2014 show that there were 28 flights to Paris, 18 flights to Brussels, and 8 flights to Istanbul. In addition to the intercontinental flights, there were flights to 17 African destinations departing from Abidjan. These destinations were almost all in North Africa, Central Africa, and West Africa. There was only one scheduled flight to an east African city, namely Nairobi, and no direct flights to Southern Africa – see figure 4.

INSERT FIGURE 4 HERE

Cote d'Ivoire gained independence from France in 1960 and the data shows that the flight patterns largely reflect a bias towards French speaking countries that shared language, cultural heritage and historical ties. Table 1 shows that only five countries out of 18 with which Cote d'Ivoire is connected directly are non-French speaking. Cote d'Ivoire is an oil producing nation and in 2014 attracted most of its investments from Shell (UK), ExxonMobil (US), and the China National Offshore Company (UNCTAD, 2014). However, these investments are not reflected by the presence of direct flights to the home countries of the above-mentioned companies. Likewise, examining the main export destinations from the country reveal them to be USA 8.5%, Netherlands 6.2%, France 5.6%, Germany 5.6%, Nigeria 5.5%, Burkina Faso 5.5%, Belgium 5.3%, India 4.6%, Ghana 4.4%, Switzerland 4.1% (WTO, 2016). International flight patterns do not mirror its economic relations with no direct flights to the USA, the Netherlands, India, or Switzerland, or to the UK and China which are large investors. Instead flight connections demonstrate a high level of historical determinism as a result of its past history as a French colony. Table 1 provides data on geographic distance, linguistic commonality, with the latter demonstrating historical and cultural ties as a result of colonialism, and economic relations as reflected through export partners. Abidjan demonstrates good connection within the West African arc of countries that are geographically close, including its main African trading partners, but longer distances are dominated by the French connection of Paris and Brussels and these two cities lead in terms of overall frequencies. As regards export partners, only six of the 15 leading partners feature in terms of direct flight connections and neither of the top two are connected, namely Netherlands and the US.

INSERT TABLE 1 HERE

4.2 Johannesburg

The intercontinental destinations that originated from Johannesburg during October 2014 were as follows: UK 183 flights, USA 164, Hong Kong 120, Australia 85, UAE 69, Germany 69; Brazil 66, Australia 62, Singapore 62; Switzerland 51, India 43, Netherlands 24, France 22, Qatar 17, Thailand 15, Turkey 15, China 12, Israel 8, and Saudi Arabia 6. The number of flights to other African cities originating from Johannesburg is reflective of South Africa's prominence as a point of connection to the rest of the continent and as one of the largest sources of FDI (both inward and outward) in Africa. In terms of regional flights, Johannesburg is well-connected servicing cities throughout Africa: Harare, Livingstone, Mauritius, Victoria Falls, Windhoek, Kasane, Francistown, Gaborone, Maun, Lubumbashi, Ndola, Luanda, Addis Ababa, Blantyre, Mahe, Zanzibar, Nairobi, Antananarivo, Cairo, Maputo, Accra, Nampula, Beira, Bulawayo, Dar es Salaam, Dakar, Entebbe, Kinshasa, Kigali, Libreville, Lilongwe, Lagos, Lusaka, Maseru, Manzini, Pointe-Noire, Pemba, Tete, Vilankulos, Walvis Bay, Inhambane, and St-Denis. The significance of Johannesburg's OR Tambo international airport as a hub in SSA, is reflected in the route map (figure 5), with direct flights to every continent and most major centres in Southern Africa, West Africa, and East Africa. It is by far the best connected city of the sample.

INSERT FIGURE 5 HERE

The data shows that the route between London and Johannesburg is the busiest intercontinental route. A common official language and its past colonial history are thereby reflected. South Africa was also a Dutch colony and one of its official languages (Afrikaans) is a derivative of Dutch and The Netherlands likewise is well-connected. Not discussed here is the fact that Cape Town is also a well-connected airport with daily year-round flights to both the UK and The Netherlands reinforcing these past relations. South Africa's flight connections represent a more diversified portfolio and this may be the result of its economic hegemony within Africa for over a century. Also South Africa was given Dominion status in the Balfour Declaration of 1926, which recognized six countries (including countries such as Canada and Australia) as "autonomous Communities within the British Empire", thus acknowledging them as political

equals of the United Kingdom. This reflects a more uniform distribution of power which may account for the more even distribution of flights. Table 2 reports on geographic distance, and linguistic historical ties between South Africa and its intercontinental flight partners. Also included are its major trading partners by exports. South Africa is generally well-connected with its export partners with only Japan and Belgium not having a direct connection amongst its top 10. Although the UK only features as the eighth largest export destination, London is the overwhelmingly most frequent flight destination reflecting its past importance both culturally and economically.

INSERT TABLE 2 HERE

4.3 Kinshasa

The data shows that there are three intercontinental flights originating from Kinshasa. The destinations for these flights are Brussels, Paris, and Istanbul with corresponding flight frequencies in October 2014 of 18, 17 and 10. In terms of regional flights, Kinshasa services flights to Addis Ababa, Brazzaville, Casablanca, Douala, Libreville, Luanda, Nairobi, and Johannesburg. It shows a strong pattern associated with past colonial ties to French-speaking Belgium with the most frequent routing, followed by France. Likewise, the majority of regional flights are to Francophone countries or to regional connecting hubs in Kenya or Ethiopia. The flight routings do not reflect trade relationships as the WTO (2016) reports that the largest export markets for the Democratic Republic of Congo are China 43.5%, Zambia 25%, South Korea 4.9%, and then only Belgium 4.8%. There is a familiar pattern with that predicted by early dependency theory of the 1960s that transport infrastructure in the colonies (peripheries) would reflect their dependency on the core (colonial powers). It is, however, revealing that five decades after independence these patterns are still evident despite changing economic relations.

4.4 Lagos

There are fourteen intercontinental flights originating from the Murtala Mohammed International Airport in Lagos – see figure 6. During October 2014, the scheduling for the

intercontinental flights shows the following frequencies as the top five destinations: Turkey, UK, UAE, Germany, and the USA. In terms of continental flights, Lagos services 17 routes to the following African cities: Abidjan, Accra, Addis Ababa, Bamako, Cairo, Casablanca, Cotonou, Dakar, Douala, Freetown, Johannesburg, Kigali, Libreville, Lome, Malabo, Monrovia, and Nairobi. Like South Africa, Nigeria's flight routes are less bound by its past colonial history which similarly may be a function of its relative economic size and economic power on the continent.

INSERT FIGURE 6 HERE

Table 3 provides data on geographic distance, linguistic commonality, and economic relations as reflected through export partners. Several interesting patterns are noticeable. First, within Africa, the country is better connected to Anglophone Africa than to Franco- or Lusophone countries. Second, it is poorly connected to new sources of economic power with no direct flights to any BRIC (Brazil, Russia, India, China) country. Third, outside of Africa, flights show a European bias followed by the United States, and flights to connecting hubs in Istanbul, Dubai and Doha. There are no direct links to South America or greater Asia (outside of the Middle East). This is unusual for an economy of this size, especially given that India and Brazil represent the largest and fourth-largest export destinations. This may be accounted for by the fact that Nigeria is Africa's largest oil producer and 95% of its exports are related to petroleum and petroleum products (Ghemawat and Altman, 2014).

INSERT TABLE 3 HERE

4.5 Luanda

The data shows that there are 13 intercontinental flights originating from the Quatro Fevero International Airport in Luanda – see figure 7. During October 2014, the scheduling for the top five intercontinental flights shows the following frequencies: Lisbon 44, Dubai 24, Brussels 16, Frankfurt 12, and London 12. Furthermore there are 11 continental destinations that originate from Luanda: Addis Ababa, Brazzaville, Cape Town, Casablanca, Harare, Johannesburg, Kinshasa, Maputo, Nairobi, Sao Tome, and Windhoek.

INSERT FIGURE 7 HERE

The flights out of Angola reveal an interesting pattern. Portugal is the most frequent intercontinental routing (almost double the next most frequent) which is a function of its past colonial ties. This is reinforced by its flights to other Portuguese-speaking countries which share a colonial past including Brazil and Mozambique. Brazil, Angola, Mozambique, and Portugal are the four largest Portuguese-speaking countries by population, are predominantly Catholic, and share some ethnic ties (for example, millions of Afro-Brazilians have considerable Angolan ancestry as a result of the transatlantic slave trade). Other significant colonial players in Africa such as the UK, France, Belgium, and the Netherlands all have direct flights to Angola. Flights to Cuba from Luanda are one of the few from the continent and this too is a result of historical ties, with Fidel Castro targeting Angola for the spread of Marxist ideology in Africa already in the 1960s and then sending large numbers of Cuban troops to fight in the post-colonial civil war in the 1970s and 1980s.

Angola's largest export partners are China, India, Spain, France, South Africa and the United States – see Table 4. Generally China and Brazil are not well connected by flights to Africa but Angola features both. Brazil is not a significant trading partner and does not feature amongst the top 15 exporting destinations and these flight connections reveal more of historical and cultural ties. China, on the other hand, is not only the largest trading partner of Angola but also one of the most significant investors. China has played an important role in the upgrading of infrastructure in the country ranging from ports to roads and harbours. Flights to its colonial master of Portugal dominate air links out of Angola and thus flight patterns are still largely affected by historical relations but with China representing new economic ties. There are no connections from Angola to the vast West African or north-eastern African regions.

INSERT TABLE 4 HERE

4.6 Maputo

There was only one intercontinental flight originating from the Maputo International Airport, namely to Lisbon with 17 flights occurring in October 2014. As regards regional flights

the following routes appear: Addis Ababa, Cape Town, Durban, Johannesburg, Luanda, and Nairobi.

Mozambique's only direct flight connection outside of Africa is thus with its past colonial master. A bilateral agreement according to which both countries designate a single carrier in the code share arrangement for the Lisbon/Maputo route, manages the flight route. The countries are tied together by language, history, religion, and other cultural features. Connecting to the rest of the world, outside of travelling via Lisbon, is done primarily through air hubs in Johannesburg, Nairobi, Addis Ababa or Luanda.

Mozambique is increasingly attracting foreign investment particularly in its growing natural resources and infrastructure markets with South Africa and China featuring prominently. In terms of export markets, these two countries again come out tops with export market shares as follows: South Africa 24.9%, China 10.2%, Italy 8.9%, India 8.9%, Belgium 7.9%, and Spain 4.4% (WTO, 2016). Outside of neighbouring South Africa, Mozambique's air links do not reflect its economic relations with no direct flights to its major trading partners, but instead reflecting its historical link with Lisbon.

5. Discussion and conclusion

The paper illustrated the passenger flight connections in SSA and asked what these patterns reveal about the region's integration and relations with the rest of the world? In particular it questioned whether they reflect the new patterns of the emerging world or past historical relations. Several features appeared from the data. First, SSA is poorly connected both intra- and inter-continent. This may be a function of its generally low economic development as well as its relative marginalization within international geo-political and economic relations. Otiso et al. (2011) illustrate that most African cities have poor airline interconnectivity among themselves as well as internationally and thus rank low on global transnational urban networks, but that there are a few cities such as Johannesburg, Cairo, Nairobi, and Casablanca that have developed relatively good international air connectivity. For example, we demonstrated that Mozambique's only flight connection outside of Africa is with Portugal, and its connections to the rest of the continent occur via hubs in four countries. Likewise, Angola, is not connected to

vast parts of Africa. Second, historical ties dominate and there appears to be elements of historical determinism in flight connections in SSA with these still reflecting the biases associated with colonialism. This confirms the work of Button et al. (2015) who focus on former French and British colonies, and find evidence of residual linkages between countries within these blocks demonstrating that colonisation continues to shape the pattern of air services in Africa. Dependency theory warned that colonialism imposed uneven power relations and that the development of infrastructure in the colonies would serve to reinforce the dominance of the core over the periphery and bind the latter to the former. The data suggests that history continues to dominate as far as flight connections go. Third, it appears that larger economies in SSA are less dependent on these past ties and that their flight connections reveal a greater level of diversity and interests. This could reflect the more even power relations between these countries and their colonial rulers. Within the sample, Nigeria and South Africa, the two largest economies in Africa, showed the most diverse routings outside of the colonial influence although even in these two countries, flights to European colonial capitals were most frequent. Smaller economies are more likely to reflect colonial ties both inter- and intra-continentally. Fourth, SSA has generally been slow to develop flight routings to the new emerging markets, not only the BRIC countries but emerging economies more broadly. Given that IATA (2014) predicts that Africa will be one of the fastest growing markets for flights for the next two decades and has been so for the past decade, this is surprising. Fifth, SSA is increasingly being serviced by Gulf carriers as well as Turkish Airlines which have targeted the continent, aware of its historically poor connectivity and its future importance and growth potential.

Lastly, what do these flight configurations reveal about how distance manifests in SSA and how it relates to economic relations? In general, intra-continental flights demonstrate four patterns largely around geographic and cultural distance, namely a) to neighbouring countries with West African, East African, and Southern African clusters, b) within these regional clusters there are biases towards countries with similar cultures as represented by language, religion, and historical colonial ties, c) hub and spoke flights are evident particularly with Johannesburg, Nairobi and Addis Ababa, leaving West Africa without a dominant hub but with several centres. All three major airlines of SSA (Ethiopian, Kenyan and South African Airways) have expressed an interest in establishing an aviation hub in West Africa trying to take advantage of the lack of dominance of any single player within that region, and d) given the large population of over a

billion people and rising income levels, the continent is poorly connected by regional flights and the lack of competition results in relatively high costs in terms of ticket prices (IATA, 2014). Intercontinentally, the data shows that cultural historical ties still dominate flight patterns and it suggests that this form of historical determinism is associated with the uneven power relations and infrastructure patterns imposed by the colonial experience. Only recently are flights to "new" parts of the world to be seen as reflected in emerging economies but these are still underrepresented and culture still dominates economics at this point. One example of this is to be seen in the relatively poor direct connections to China despite its increasing presence on the continent (Ado and Su, 2016). Likewise, with India which only has direct flight connections to South Africa amongst our six countries.

The paper is exploratory and cannot definitively explain why these flight patterns still demonstrate such overwhelming past relations but they are suggestive. Its contribution lies not only in outlining these patterns but also aides in future work on SSA and how to think about the continent's integration into the global economy and international business networks. It is a region that is vastly under-researched within international business and there are growing calls for a research agenda to focus on the continent (Amankwah-Amoah, 2016; Roberts and Dörrenbächer, 2016). It draws on inter-disciplinary accounts from development and political economics, international business, and history, and argues that these all need to be considered and that one cannot reduce explanations to single dimensions. Whilst distance matters; how it matters varies. SSA's relatively low levels of development may account for why culture and historical ties still dominate over economics, but that is unlikely to be true for other parts of the world.

In terms of implications, it raises the difficulty for SSA of becoming more globally integrated, when it is so poorly connected through air links. Given the importance of air transport to the global economy, it is important to ensure that the continent becomes more connected through flights. There are number of dimensions to this. Earlier we examined the deficient track record of African airlines which have been plagued by maladministration, high costs, and government interference, and this needs to be addressed by bringing in the necessary expertise and depoliticising the operation of the sector. This may require the sale of equity stakes in national carriers to other airlines that can bring in the necessary expertise. An alternative is

demonstrated by the recent signing of a ten-year management agreement between the national airline of Angola and Emirates, without the latter taking on any equity. This followed the Angolan airline being banned from entering into European airspace because of safety concerns, and the firing of its entire board. For the continent as a whole, the failure to effectively and fully implement the Yamoussoukro Decision of 1999 and to deregulate air services and open their markets to transnational competition, is an implementation imperative. Given the lack of a critical mass for most airlines on the continent, it seems likely that the industry will resolve itself into four or five hubs (Pirie, 2014), but this will necessitate better intra-African connections through these hubs and this is still a clear weakness. The improvement of the infrastructure at airports is another priority and we have seen some moves in this direction with plans for airport upgrades in a number of countries, and the most significant project being the US$4 billion new Addis Ababa International Airport with an estimated completion date of 2024. At a broader international political economy level, the research demonstrates the continued marginalisation of the continent - not only in terms of its share of world trade and investment, but also in terms of air traffic market share - and this may require a concerted push to promote trade and investment and development on the continent. It is especially important for new economic ties to be developed which do not reinforce past colonial relations and which integrate African firms into new global value chains.

The research has limitations and as stated before is exploratory in nature. It relied on the most comprehensive databases for commercial flights available but there are limitations in terms of what they record but these are likely to be relatively minor. There is a dearth of data available on SSA (for example, the lack of cultural distance data for large numbers of countries within SSA, and bilateral FDI data) so this paper contributes towards an understanding of the continent and its integration into the global arena. Extracting commercial passenger flight data was not a trivial exercise and the paper excluded chartered and cargo flights and the latter especially is an important topic for future research. Arvis and Shepherd (2011) demonstrate a link between economic activity and the presence of a transport network to support and enable connectivity between geographically dispersed locations and this work will aide future research that seeks to econometrically model the relationship between flight connections and economic activities within SSA.

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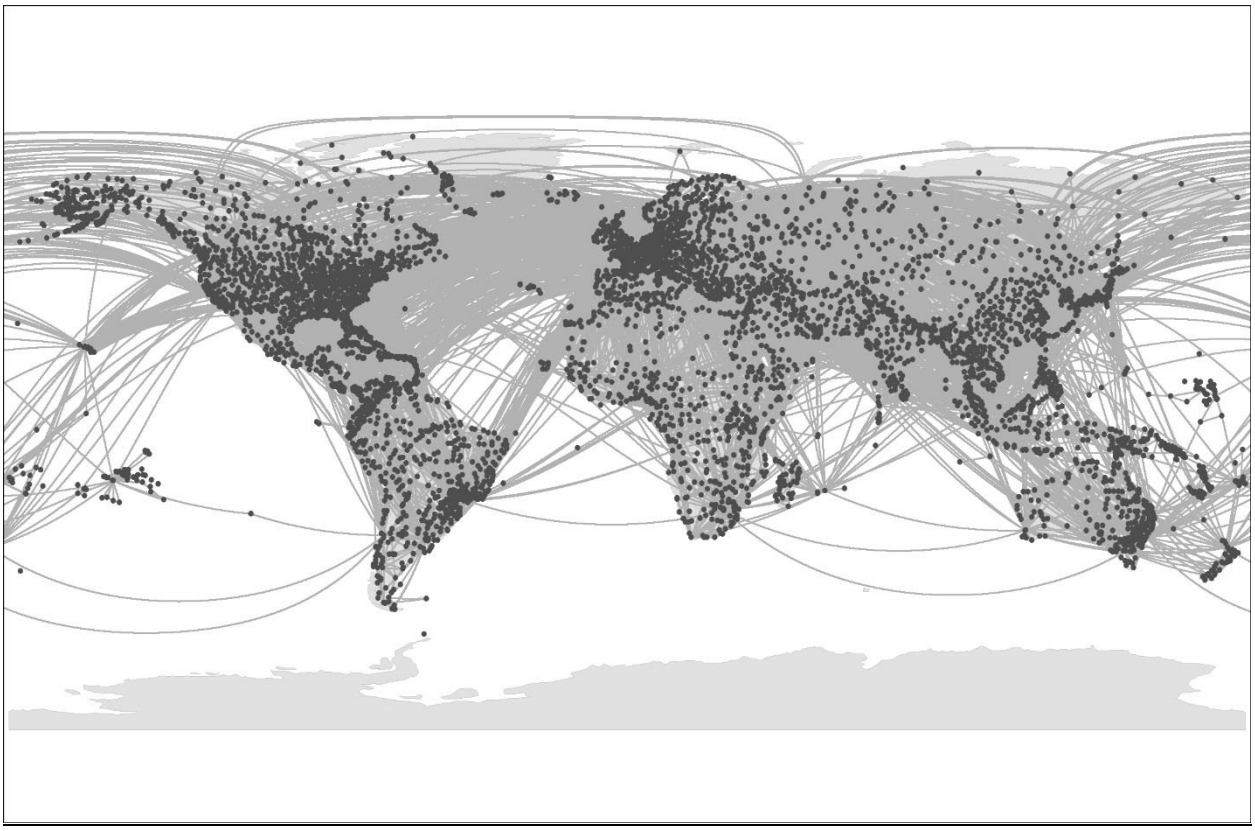

Figure 1: All global passenger flight routes

Figure 2: Intercontinental sub-Saharan passenger flight routes

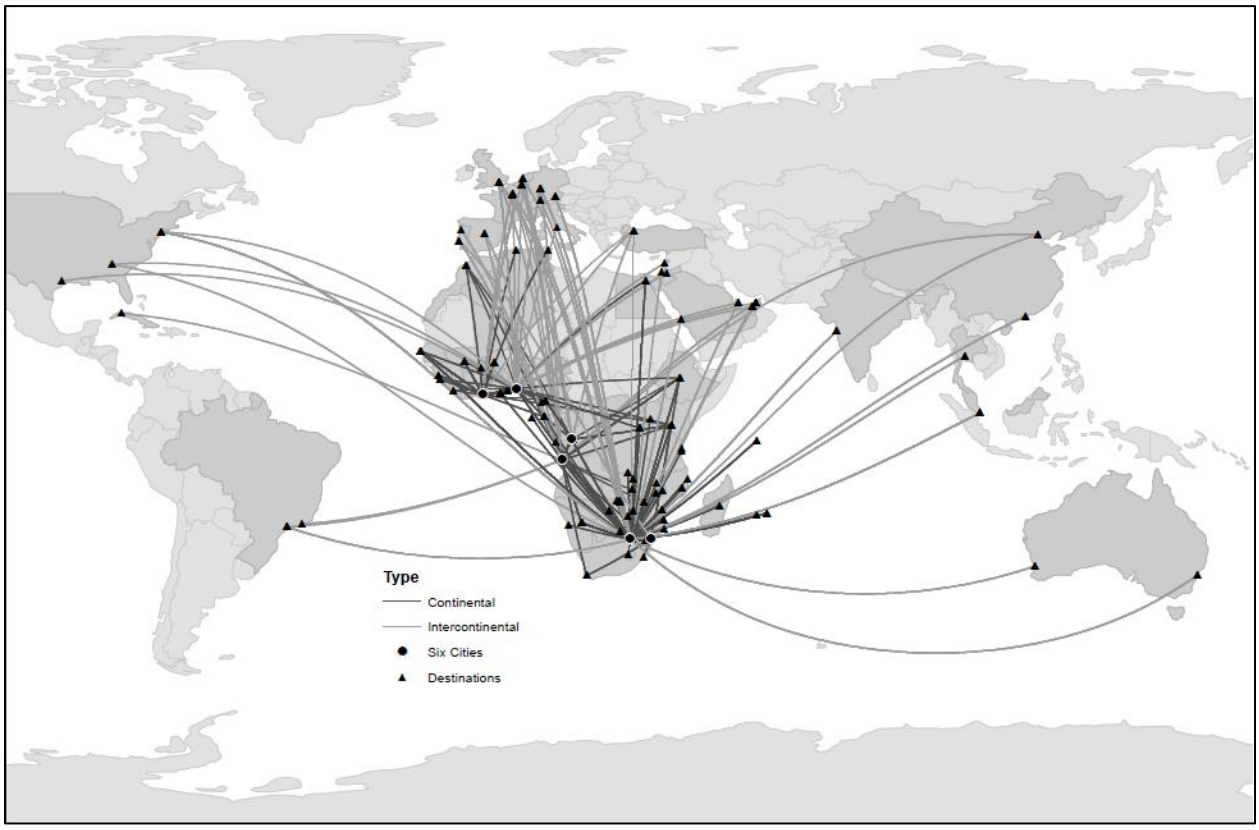

Figure 3: Regional and intercontinental flights for the sample of six cities in SSA

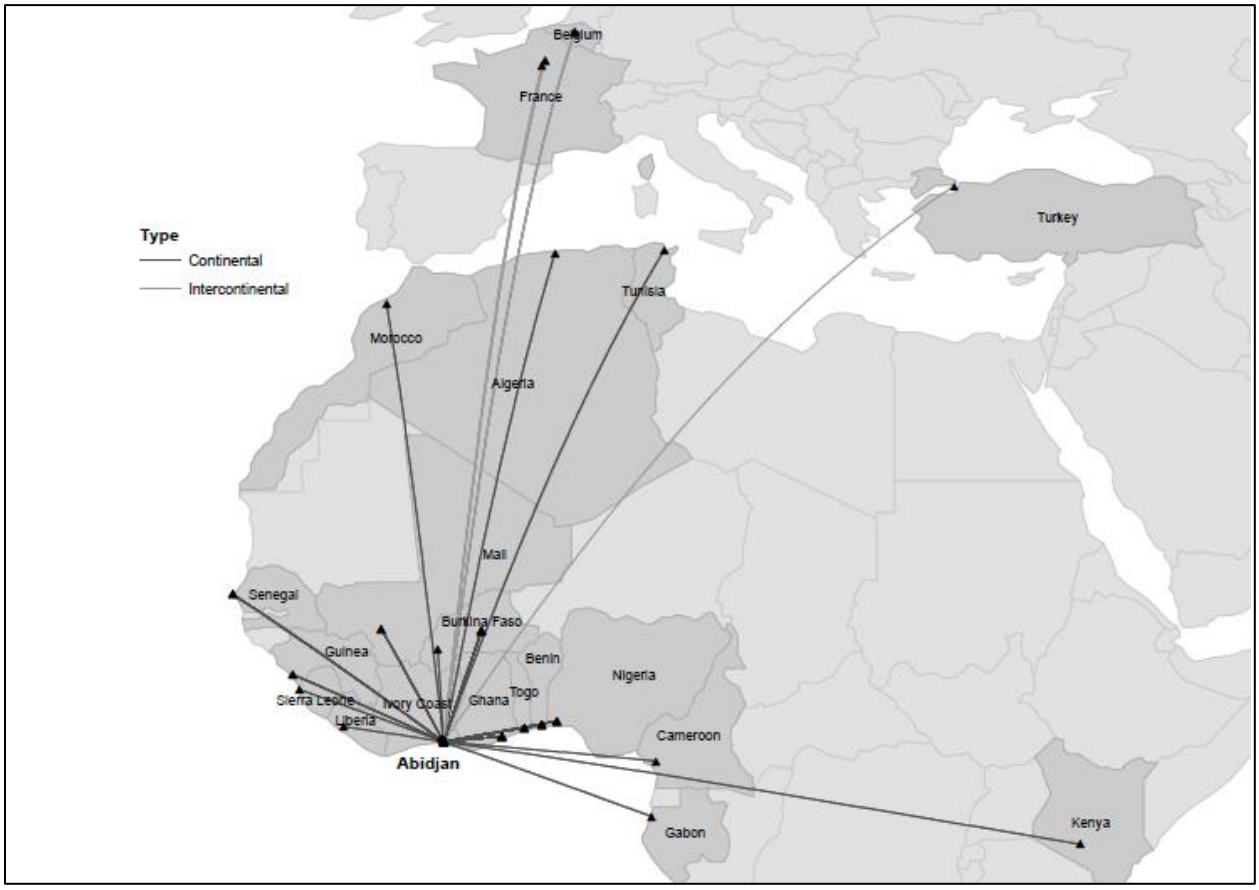

Figure 4: Abidjan international flight routes October 2014

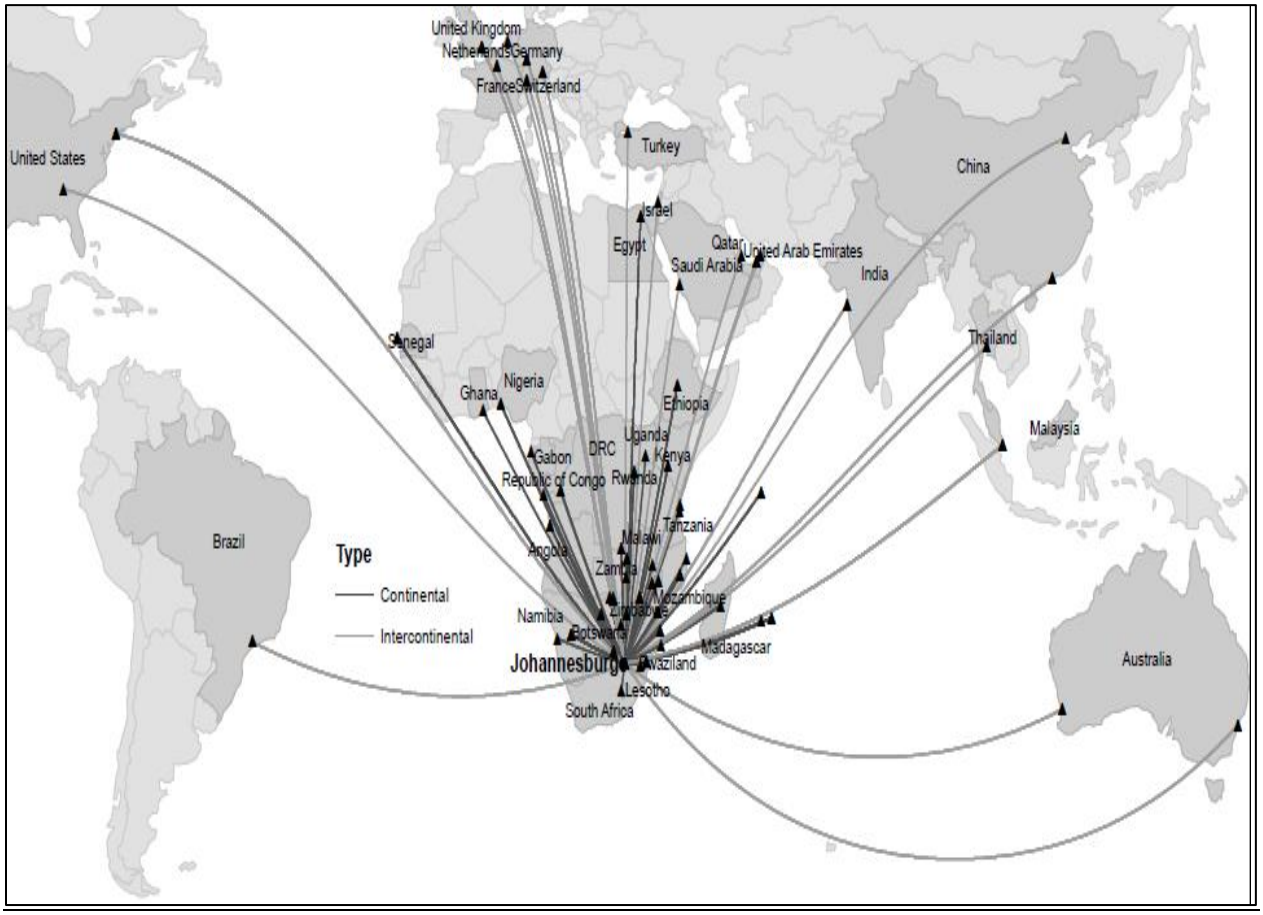

Figure 5: Johannesburg international flight routes

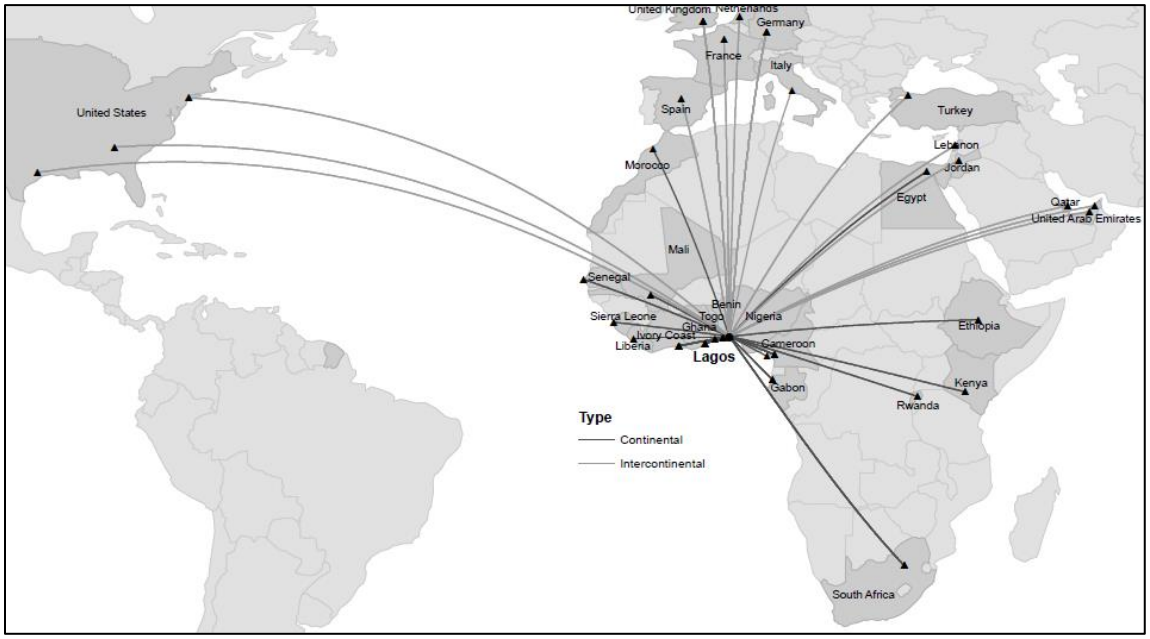

Figure 6: International flights originating from Lagos

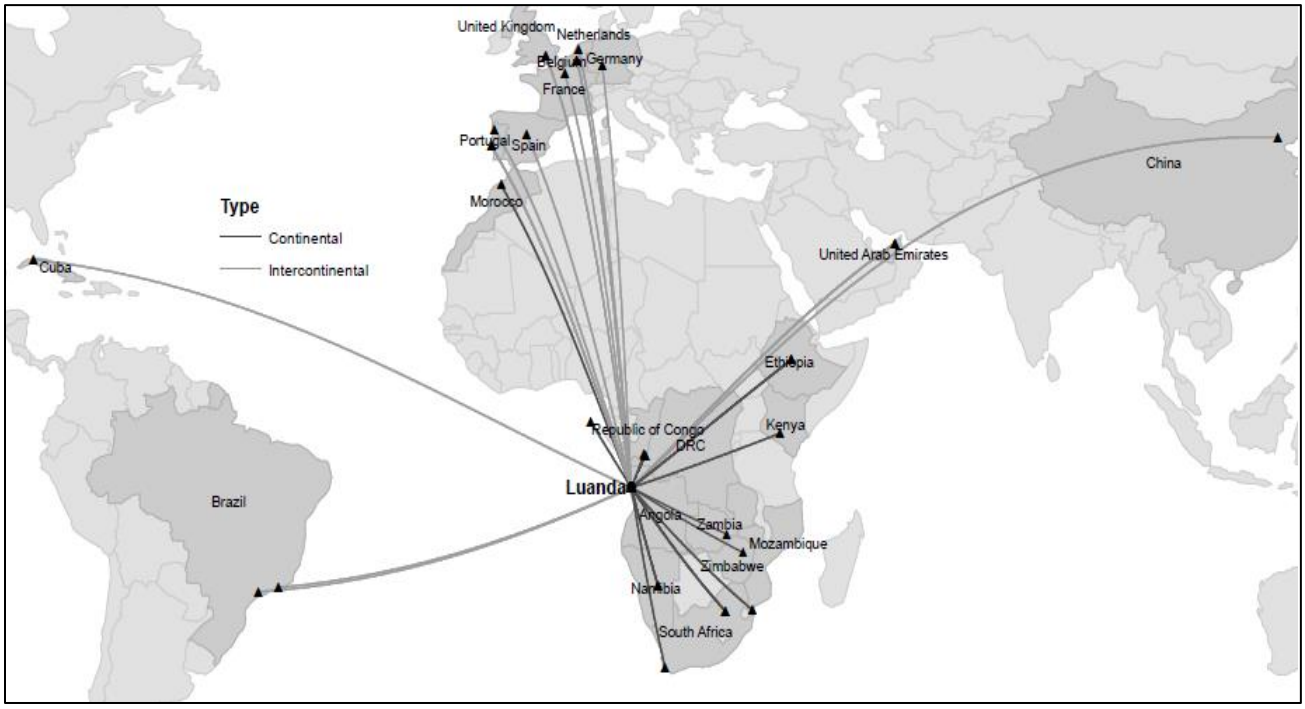

Figure 7: Luanda international flight routes

Table 1: Dimensions of distance and economic relations - Cote d'Ivoire and its international flight connections

	Geographic	Official language in common or significant lingua franca from colonial ties	Top 15 export partners in rank order (% of total exports)	
Algeria	2380	Y		
Belgium	4840	Y	Netherlands	12.05
Benin	815	Y	United States	8.12
Burkina Faso	646	Y	Belgium	6.54
			France	6.43
Cameroon	1891	Y	Germany	6.09
France	4283	Y	Burkina Faso	4.52
Gabon	2112	Y	India	4.18
Ghana	331	N	Mali	4.12
Guinea	643	Y	Nigeria	4.00
Kenya	4832	N	Ghana	3.89
Liberia	524	N	Switzerland	3.88
Mali	1008	Y	Vietnam	2.97
Morocco	2672	Y	South Africa	2.70
Nigeria	1447	N	Spain	2.57
Senegal	1188	Y	United Kingdom	2.45
Sierra Leone	718	Y		
Togo	680	Y		
Tunisia	3231	Y		
Turkey	5275	N		

Source: Geographic measure (Berry et al., 2010); Export partners (World Integrated Trade Solution, World Bank, 2017)

Table 2: Dimensions of distance and economic relations - South Africa and its intercontinental flight connections

	Geographic	Official Language in Common	Top 20 export partners in rank order* (% of total exports)	
Australia	10234	Y		
Brazil	8418	N	China	8.33
China	11083	N	United States	7.54
France	8640	N	Germany	6.09
Germany	9028	N	Namibia	5.52
Hong Kong	11213	N	Botswana	5.45
India	7883	Y	Japan	5.23
Israel	6831	N	India	4.52
Netherlands	9246	Y	United Kingdom	4.39
Qatar	6731	N	Belgium	3.29
Saudi Arabia	6418	N	Zambia	3.15
Singapore	9103	Y	Mozambique	3.08
Switzerland	8612	N	Netherlands	2.62
Thailand	9516	N	Zimbabwe	2.58
Turkey	7656	N	Hong Kong, China	2.13
UAE	6718	N	Swaziland	1.68
UK	9574	Y	UAE	1.63
	14562	Y	Italy	1.60
			Lesotho	1.49
			Korea, Rep.	1.40
USA			Spain	1.36

Source: Geographic measure (Berry et al., 2010); Export partners (World Integrated Trade Solution, World Bank, 2017)

* We have listed the top 20, instead of the top 15 because a number of neighbouring countries of South Africa are landlocked which affects South Africa's trade figures

Table 3: Dimensions of distance and economic relations - Nigeria and its international flight connections

	Geographic	Official language in common or significant lingua franca from colonial ties	Top 15 export partners in rank order (% of total exports)	
Benin	633	N		
Cameroon	627	Y	India	14.56
Egypt	2986	N	Netherlands	10.20
Ethiopia	3305	N	Spain	9.31
France	4048	N	Brazil	8.08
Germany	4565	N	France	5.73
Ghana	1122	Y	United Kingdom	5.06
Italy	3685	N	South Africa	4.96
Ivory Coast	1447	N	Italy	4.38
Jordan	3719	N	Indonesia	3.92
Kenya	3468	Y	United States	3.84
Lebanon	3886	N	Japan	3.17
Liberia	1967	Y	Cote d'Ivoire	2.27
Mali	1514	N	Turkey	2.17
Netherlands	4736	N	Portugal	1.72
Qatar	4872	N	Germany	1.69
Rwanda	2781	N		
Senegal	2436	N		
Sierra Leone	2149	Y		
South Africa	4670	Y		
Spain	3545	N		
Togo	784	N		
Turkey	4197	N		
UAE	5113	N		
UK	4979	Y		
USA	10620	Y		

Source: Geographic measure (Berry et al., 2010); Export partners (World Integrated Trade Solution, World Bank, 2017)

Table 4: Dimensions of distance and economic relations - Angola and its international flight connections

	Geographic	Official Language in Common	Top 15 export partners in rank order (% of total exports)	
Belgium	7190	N		
Brazil	8005	Y	China	43.20
China	10501	N	India	8.10
Cuba	11393	N	Spain	6.78
DRC	1337	N	France	4.74
Ethiopia	3141	N	South Africa	4.08
France	6720	N	United States	3.66
Kenya	2627	N	Portugal	3.60
Morocco	5552	N	Italy	3.34
Mozambique	1882	Y	Netherlands	3.31
Namibia	1070	N	Canada	3.13
Netherlands	7339	N	United Kingdom	2.79
Portugal	6407	Y	UAE	1.99
R.Congo	1337	N	Indonesia	1.71
South Africa	1566	N	Panama	1.18
Spain	6291	N	Singapore	0.64
UAE	5606	N		
UK	7654	N		
Zambia	1274	N		
Zimbabwe	1485	N		

Source: Geographic measure (Berry et al., 2010); Export partners (World Integrated Trade Solution, World Bank, 2017)

[i] The original dependency theory (Singer, 1950) maintained that poorer countries in the periphery exchange minerals and agricultural products in order to obtain finished products from wealthier countries, thus enriching the latter at the expense of local economies thus resulting in diminished competitive advantage for the peripheral countries.